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A NON PROFIT ORGANIZATION

**FRONT COVER**

JASON OAKLEY HAS BEEN BUSY ON THE FRONT COVER ONCE MORE WHICH RELATES TO THE COMING FESTIVE SEASON INSIDE. THANKS JASON.

**-\*\* MERRY CHRISTMAS AND HAPPY NEW YEAR \*\*-**

**HELP - SELL & TELL**

**PAGE 3**

GET WELL WISHES, BABY CONGRATULATIONS, GOOD NEWS AND PUBLIC DOMAIN LISTING.

**EXTENDED DOS V12.1 PART II  
BY LESLIE MILBURN**

**PAGES 4-6**

THIS CONCLUDES EXT12.1 AND HAS ONE MODIFICATION TO IMPROVE IT. THIS UTILITY IS VERY HANDY FOR CONVERTING SOURCE CODE FILES. SEE PAGES 14-15.

**VZ BUS MOUSE PART 2 BY L MILBURN PAGES 7-11**

PART 3 WILL BE THE FINAL ONE WITH SOME CIRCUITS TO HELP YOU OUT IN CONSTRUCTING A MOUSE PORT OR MODIFYING THE PRINTER INTERFACE.

**HI-RES GRAPHICS GEOMETRIC  
PLOTING BY BOB KITCH**

**PAGES 11-13**

BOB CONTINUES IN PROVIDING MOST OF US WITH A BETTER UNDERSTANDING OF BASIC TOGETHER WITH A LINPLOT, A DEMONSTRATION PROGRAM.

**LET ' S INVESTIGATE SOUND PART IV  
BY BOB KITCH**

**PAGE 13**

MY APOLOGIES TO OUR READERS AND BOB AS I MISSED PART IV IN BOB'S EARLIER SERIES ON INVESTIGATING SOUND ON THE VZ.

**DOS FILETYPE CONFUSION**

**PAGES 14-15**

THIS ARTICLE DETAILS THE MAJOR FILETYPES USED BY DISK VERSIONS OF EDITOR ASSEMBLERS AND WORD PROCESSORS AND HOW TO OVERCOME INCOMPATIBILITY BETWEEN EDITOR ASSEMBLER SOURCE CODE FILES.

**TECHNICAL DATA SHEETS # 3 & 4 PAGES 16-18**

Z80A TIMING DIAGRAM, 74LS138 TRUTH TABLE AND INPUT/OUTPUT DECODERS ARE TOUCHED UPON THIS TIME.

**DAVE MITCHELL SOFTWARE FOR SALE  
PATCH3.3 - EXT DOS  
MENU/FILE COPIER**

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**PETER HICKMAN SOFTWARE  
VZ MODEM & M/C DISASSEMBLER  
PUBLIC DOMAIN**

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**USER GROUPS \* NEWS \* SUBSCRIPTIONS PAGE 20**

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## GET WELL SOON HARRY HUGGINS

ON BEHALF OF ALL VZ USERS AND MYSELF WE WISH HARRY HUGGINS A SPEEDY AND FULL RECOVERY FROM A RECENT STROKE. I BELIEVE HARRY IS COMING TO NSW (PREMIER STATE) TO RECUPERATE. SAFE JOURNEY HARRY.

## CONGRATULATIONS MR & MRS HICKMAN

PETER AND DONNA ARE THE PROUD PARENTS OF A NEW BABY BOY (THAT IS TWO BOYS AND TWO GIRLS NOW). WE WISH THEM ALL GOOD HEALTH, WEALTH AND HAPPINESS FOR THE FUTURE.

## GOOD NEWS FOR A CHANGE

I'VE FINALLY ACQUIRED THE BLOCK OF LAND I WAS AFTER. PLANS HAVE BEEN SUBMITTED TO COUNCIL WITH BUILDING TO START SOMETIME IN FEBRUARY. MY NEW ADDRESS WILL BE: 35 IIGHES ICE IIGHES HILL 2297

MY ELDEST DAUGHTER AND SON IN LAW ARE EXPECTING MY SECOND GRANDCHILD LATE JANUARY. THE BEST NEWS IS THAT THEY ARE MOVING TO NECASTLE SOMETIME IN MARCH. I WILL BE ABLE TO SEE MY GRANDCHILDREN MORE OFTEN. IT SURE BEATS TRAVELLING TO MELBOURNE (BRRR).

## PUBLIC DOMAIN LISTING

### RUSSELL HARRISON

XB - EXTENDED BASIC/DOS.  
 XB2 - EXTENDED BASIC/DOS & SOURCE CODE.  
 FASTDISK - IMPROVED DISK FORMATTER & SOURCE CODE.  
 WORDPRO - DISK VERSION OF E & F TAPE WORD PROCESSOR.  
 8K DOS EPROM - IMPROVED VERSION OF STANDARD DOS ROM.

### LESLIE MILBURN

QW3.3 & QW4.2.2 - BASIC WORD PROCESSORS  
 QWII.4.7 - 64K WORD PROCESSOR  
 DISKOPS 1-4 - EDITOR ASSEMBLER.  
 DISKOPS 6 - 64K EDITOR ASSEMBLER (EXTRA FUNCTIONS).

### JASON OAKLEY

DISKMAG 1 TO 4 - VZ PUBLICATION ON DISK.

### ROBERT QUINN

DDATA & TDATA - DISK & TAPE DATABASES (LOTS OF EXTRA FUNCTIONS).

### PETER HICKMAN

VZ M/C DISASSEMBLER - OBJECT AND SOURCE CODE.  
 VZ MODEM SOFTWARE - OBJECT AND SOURCE CODE.  
 SEE PAGE 19 FOR DESCRIPTION OF SOFTWARE AND ADDRESS.

### STEVE FAITH

VZ DISK MENU - OBJECT AND SOURCE CODE.  
 SINGLE TRACK COPIER - OBJECT AND SOURCE CODE.

**NOTE :** CONTACT THE EDITOR FOR MORE INFORMATION ON ABOVE PROGRAMS, CONTACT ADDRESSES, ETC. ALTHOUGH ALL ABOVE ARE PUBLIC DOMAIN, A NOMINAL CHARGE WILL APPLY TO COVER COSTS LIKE DISKS, POST AND PACKING.

AUTHORS: IF YOU WOULD LIKE TO DECLARE YOUR WORK PUBLIC DOMAIN AS WELL THEN INFORM THE EDITOR PLEASE.

```

00373      CP      40
00374      JR      Z,EXAX
00375      LD      (IY+18),A
00376      XOR      A
00377      JR      EXA2
00378 EXAX POP  HL
00379      OR      A
00380      RET
00381 ;*****
00382 ;DSCT: THIS FUNCTION
00383 ;      DISPLAYS THE CURRENT
00384 ;      SECTOR IN THE INPUT
00385 ;      BUFFER ON THE SCREEN.
00386 DSCT LD   H,(IY+50)
00387      LD   L,(IY+49)
00388      LD   DE,28672
00389      LD   BC,128
00390      LDIR
00391      LD   HL,28832
00392      LD   (7820H),HL
00393      LD   HL,DMSG
00394      CALL PMSG
00395      LD   C,(IY+18)
00396      CALL DHEX
00397      LD   A,COMA
00398      CALL PCHR
00399      LD   C,(IY+17)
00400      CALL DHEX
00401      LD   A,13
00402      CALL PCHR
00403      RET
00404 DMSG EQU  $
00405 :1
00406 *CURRENT TRACK,SECTOR = *
00407      DEFB 0
00408 ;*****
00409 ;DHEX: THIS DISPLAYS A
00410 ;      BINARY NO STORED IN
00411 ;      THE C REG AS AN ASCII
00412 ;      HEX PAIR AT THE
00413 ;      CURRENT CURSOR POS.
00414 DHEX LD   A,0F0H
00415      AND   C
00416      RRCA
00417      RRCA
00418      RRCA
00419      RRCA
00420      CALL DHX1
00421      LD   A,0FH
00422      AND   C
00423      CALL DHX1
00424      RET
00425 DHX1 ADD  A,48
00426      CP   58
00427      JP   M,DHX2
00428      ADD  A,7
00429 DHX2 CALL PCHR
00430      RET
00431 ;*****
00432 ;DIS: THIS FUNCTION DISPLAYS
00433 ;      THE ENTIRE DIRECTORY
00434 ;      INCLUDING START AND
00435 ;      END ADDRESSES. THE
00436 ;      FIRST CHARACTER AFTER
00437 ;      THE COMMAND INDICATES
00438 ;      WHICH FILE TYPES TO
00439 ;      DISPLAY.
00440 DIS  CALL GCHR
00441      CP   "I"
00442      SCF
00443      RET  NZ
00444      CALL GCHR
00445      CP   "S"
00446      SCF
00447      RET  NZ
00448      CALL GCHR
00449      JR   Z,DIS2
00450 DIS1 PUSH AF
00451      CALL GCHR
00452      JP   NZ,SYER
00453      JR   DIS3
00454 DIS2 XOR   A
00455      PUSH AF
00456 DIS3 EX   (SP),HL
00457      PUSH HL
00458      LD   (IY+17),0
00459      LD   (IY+18),0
00460 DIS4 DI
00461      CALL PWON
00462      CALL SECT
00463      CALL PWF
00464      EI
00465      LD   H,(IY+50)
00466      LD   L,(IY+49)
00467      POP  AF
00468      LD   DE,16
00469      LD   C,A
00470      LD   B,8
00471 DIS5 PUSH BC
00472      XOR   A
00473      CP   C
00474      JR   Z,DIS6
00475      LD   A,(HL)
00476      CP   C
00477      JR   Z,DIS7
00478      CP   0
00479      JR   Z,DISY
00480 SKIP ADD  HL,DE
00481      JR   DISB
00482 DIS6 LD   A,(HL)
00483      CP   0
00484      JR   Z,DISY
00485      CP   1
00486      JR   Z,SKIP
00487 DIS7 LD   B,10
00488 DIS8 LD   A,(HL)
00489      CALL PCHR
00490      INC  HL
00491      DJNZ DIS8
00492      LD   A,32
00493      CALL PCHR
00494      CALL PCHR
00495      CALL PCHR
00496      LD   B,2

```

```

00497 DIS9 LD C, (HL)
00498 CALL DHEX
00499 LD A, 32
00500 CALL PCHR
00501 INC HL
00502 DJNZ DIS9
00503 LD B, 2
00504 DISA INC HL
00505 LD C, (HL)
00506 CALL DHEX
00507 DEC HL
00508 LD C, (HL)
00509 CALL DHEX
00510 INC HL
00511 INC HL
00512 LD A, 32
00513 CALL PCHR
00514 DJNZ DISA
00515 LD A, 13
00516 CALL PCHR
00517 DISB POP BC
00518 DJNZ DIS5
00519 LD A, (IY+17)
00520 INC A
00521 CP 16
00522 JR Z, DISX
00523 LD (IY+17), A
00524 DISC CALL WKEY
00525 CP 1
00526 JR Z, DISX
00527 CP 32
00528 JR NZ, DISC
00529 LD A, C
00530 PUSH AF
00531 JP DIS4
00532 DISY POP BC
00533 DISX POP HL
00534 OR A
00535 RET
00536 ;*****
00537 ;CHA: THIS FUNCTION CHANGES
00538 ; THE FILETYPE OF ANY
00539 ; FILE.
00540 CHA CALL GCHR
00541 CP "H"
00542 SCF
00543 RET NZ
00544 CALL GCHR
00545 CP "A"
00546 SCF
00547 RET NZ
00548 INC HL
00549 ;SAVE RETURN ADDR ON STACK.
00550 LD DE, CHA1
00551 PUSH DE
00552 ;SAVE BUFFER POINTER.
00553 PUSH HL
00554 LD HL, (CSI+1)
00555 INC HL
00556 LD A, (HL)
00557 INC HL
00558 LD H, (HL)
00559 LD L, A
00560 ;HL POINTS TO FUNCTION CALL
00561 ;MADE AT BEGINNING OF CSI
00562 ;FUNCTION.
00563 EX (SP), HL
00564 RET
00565 CHA1 OR A
00566 SCF
00567 RET NZ
00568 LD A, (HL)
00569 CP COMA
00570 SCF
00571 RET NZ
00572 CALL GCHR
00573 JP Z, SYER
00574 PUSH AF
00575 CALL GCHR
00576 JP NZ, SYER
00577 EX (SP), HL
00578 ;HL = NEW FILETYPE
00579 PUSH HL
00580 DI
00581 CALL PWON
00582 CALL SRCH
00583 CP 2
00584 LD A, 13
00585 JP NZ, DERR
00586 IN A, (19)
00587 PUSH AF
00588 CALL PWOFF
00589 EI
00590 POP AF
00591 BIT 7, A
00592 JR Z, CHA2
00593 LD A, 4
00594 JP DERR
00595 CHA2 LD HL, 10
00596 EX DE, HL
00597 OR A
00598 SBC HL, DE
00599 POP AF
00600 LD (HL), A
00601 DI
00602 CALL PWON
00603 CALL WRTE
00604 CALL PWOFF
00605 EI
00606 POP HL
00607 OR A
00608 RET
00609 ;*****
00610 ;REL: THIS FUNCTION
00611 ; RELOCATES A FILE. I.E.
00612 ; THE START ADDRESS OF A
00613 ; FILE MAY BE CHANGED.
00614 REL CALL GCHR
00615 CP "E"
00616 SCF
00617 RET NZ
00618 CALL GCHR
00619 CP "L"
00620 SCF

```

00621	RET	NZ	00673	LD	A, (HL)	
00622	INC	HL	00674	INC	HL	
00623	;SAVE	RETURN ADDR ON STACK	00675	LD	H, (HL)	
00624	LD	DE, REL1	00676	LD	L, A	
00625	PUSH	DE	00677	RST	18H	
00626	;SAVE	BUFFER POINTER.	00678	JR	Z, REL5	
00627	PUSH	HL	00679	JR	C, REL3	
00628	LD	HL, (CSI+1)	00680	OR	A	
00629	INC	HL	00681	SBC	HL, DE	
00630	LD	A, (HL)	00682	POP	DE	
00631	INC	HL	00683	EX	(SP), HL	
00632	LD	H, (HL)	00684	LD	(HL), E	
00633	LD	L, A	00685	INC	HL	
00634	EX	(SP), HL	00686	LD	(HL), D	
00635	RET		00687	INC	HL	
00636	REL1	OR	A	00688	LD	E, (HL)
00637	SCF		00689	INC	HL	
00638	RET	NZ	00690	LD	D, (HL)	
00639	LD	A, (HL)	00691	EX	(SP), HL	
00640	CP	COMA	00692	EX	DE, HL	
00641	SCF		00693	OR	A	
00642	RET	NZ	00694	SBC	HL, DE	
00643	INC	HL	00695	JR	REL4	
00644	CALL	HEX	00696	REL3	EX	DE, HL
00645	RET	C	00697	OR	A	
00646	PUSH	DE	00698	SBC	HL, DE	
00647	DEC	HL	00699	POP	DE	
00648	CALL	GCHR	00700	EX	(SP), HL	
00649	JP	NZ, SYER	00701	LD	(HL), E	
00650	EX	(SP), HL	00702	INC	HL	
00651	PUSH	HL	00703	LD	(HL), D	
00652	DI		00704	INC	HL	
00653	CALL	PWON	00705	LD	E, (HL)	
00654	CALL	SRCH	00706	INC	HL	
00655	CP	2	00707	LD	D, (HL)	
00656	LD	A, 13	00708	EX	(SP), HL	
00657	JP	NZ, DERR	00709	ADD	HL, DE	
00658	IN	A, (19)	00710	REL4	EX	DE, HL
00659	PUSH	AF	00711	POP	HL	
00660	CALL	PWOF	00712	LD	(HL), D	
00661	EI		00713	DEC	HL	
00662	POP	AF	00714	LD	(HL), E	
00663	BIT	7, A	00715	DI		
00664	JR	Z, REL2	00716	CALL	PWON	
00665	LD	A, 4	00717	CALL	WRTE	
00666	JP	DERR	00718	CALL	PWOF	
00667	REL2	EX	DE, HL	00719	EI	
00668	INC	HL	00720	JR	RELX	
00669	INC	HL	00721	REL5	POP	HL
00670	POP	DE	00722	POP	HL	
00671	PUSH	HL	00723	RELX	POP	HL
00672	PUSH	DE	00724	OR	A	
			00725	RET		

AFTER ENTERING ALL THE SOURCE CODE INSERT THE FOLLOWING LINE WHICH WILL CLEAR THE SCREEN WHEN EXT12.1 IS RUN.

```
I50
CALL CLS
```

SAVE SOURCE AND OBJECT CODES. ORIGIN CAN BE ANY MEMORY LOCATION OF YOUR CHOICE.

## THE 53 MOUSE DRIVER FUNCTIONS:

AS MENTIONED IN PART 1, THE STANDARD MICROSOFT MOUSE DRIVER PROVIDES 53 FUNCTIONS. NOT ALL OF THESE ARE CURRENTLY PROVIDED IN THE VZ BUS MOUSE DRIVER. BEFORE DETAILING EACH VZ MOUSE FUNCTION, HERE ARE THE DEFINITIONS OF SOME TERMS:-

### (1) THE BUTTON REGISTER:

THIS REGISTER INDICATES WHETHER A PARTICULAR BUTTON IS PRESSED OR RELEASED.

BIT 0 CORRESPONDS TO THE LEFT BUTTON  
BIT 1 CORRESPONDS TO THE RIGHT BUTTON  
BIT 2 CORRESPONDS TO THE MIDDLE BUTTON (IF AVAILABLE).

IF A BIT IS SET THE THE BUTTON IS "HELD" OTHERWISE IT IS "RELEASED".

### (2) BUTTON NUMBERS:

SOME FUNCTIONS REQUIRE A BUTTON NUMBER. THESE ARE AS FOLLOWS:-

0 = LEFT BUTTON  
1 = RIGHT BUTTON  
2 = MIDDLE BUTTON.

### (3) MOUSE MOTION COUNTERS:

MOUSE MOVEMENT IS SOMETIMES REFERED TO AS MICKEYS, AND THE VALUE STORED IN A COUNTER AS THE MICKY COUNT.

### (4) PASSED AND RETURN VALUES:

ONLY THE BASIC VARIABLES WHICH ARE OF IMPORTANCE TO A PARTICULAR FUNCTION ARE LISTED. UPON RETURN, THOSE VARIABLES NOT MENTIONED MAY OR MAY NOT HAVE BEEN MODIFIED.

## THE VZ MOUSE DRIVER FUNCTIONS:-

### FUNCTION 0 - DRIVER RESET.

PARAMETERS: M1%=0  
RETURN VALUES: NONE.

**DESCRIPTION:** THIS FUNCTION RESETS THE MOUSE DRIVER. THE FOLLOWING CONDITIONS ARE SET:-

MIN HORIZONTAL POS = 0  
MAX HORIZONTAL POS = 31  
MIN VERTICAL POS = 0  
MAX VERTICAL POS = 15  
CURRENT POS: HORIZ = 15  
                  VERT. = 7  
INTERNAL CURSOR FLAG = -1 (CURSOR HIDDEN)  
TEXT CURSOR = ARROW  
MOUSE POLLING RATE = 100 PER INTERRUPT

### FUNCTION 1 - SHOW CURSOR.

PARAMETERS: M1% = 1  
RETURN VALUES: NONE.

DESCRIPTION: THIS FUNCTION INCREMENTS THE INTERNAL CURSOR FLAG. IF IT EQUALS ZERO THE CURSOR IS DISPLAYED AT THE CURRENT POSITION.

FUNCTION 2 - HIDE CURSOR.

PARAMETERS: M1% = 2  
RETURN VALUES: NONE.

DESCRIPTION: THIS FUNCTION REMOVES THE CURSOR FROM THE SCREEN AND DECREMENTS THE INTERNAL CURSOR FLAG.

FUNCTION 3 - GET BUTTON STATUS AND MOUSE POSITION.

PARAMETERS: M1% = 3  
RETURN VALUES: M2% = BUTTON REGISTER  
M3% = CURRENT HORIZONTAL POS.  
M4% = CURRENT VERTICAL POS.

DESCRIPTION: THIS FUNCTION RETURNS THE STATUS OF THE MOUSE BUTTONS AND THE CURRENT MOUSE POSITION.

FUNCTION 4 - SET MOUSE POSITION.

PARAMETERS: M1% = 4  
M3% = NEW HORIZONTAL POS.  
M4% = NEW VERTICAL POS.  
RETURN VALUES: NONE.

DESCRIPTION: THIS SETS THE MOUSE CURSOR TO THE POSITION SPECIFIED. THIS MUST BE WITHIN THE MIN AND MAX RANGES IN THE VERTICAL AND HORIZONTAL DIRECTIONS. IF NOT THE CLOSEST POINT IS CHOSEN.

FUNCTION 5 - GET BUTTON PRESS INFO.

PARAMETERS: M1% = 5  
M2% = BUTTON NUMBER.  
RETURN VALUES: M1% = BUTTON REGISTER  
M2% = NUMBER OF BUTTON PRESSES  
M3% = HORIZONTAL POS AT LAST PRESS.  
M4% = VERTICAL POS AT LAST PRESS.

DESCRIPTION: THIS FUNCTION RETURNS THE BUTTON REGISTER, THE NUMBER OF PRESSES OF THE SPECIFIED BUTTON SINCE THIS FUNCTION WAS LAST CALLED AND IF THAT WAS NON-ZERO, THE POSITION OF THE MOUSE CURSOR AT THE LAST PRESS.

FUNCTION 6 - GET BUTTON RELEASE INFO.

PARAMETERS: M1% = 6  
M2% = BUTTON NUMBER.  
RETURN VALUES: M1% = BUTTON REGISTER  
M2% = NUMBER OF BUTTON RELEASES  
M3% = HORIZONTAL POS AT LAST RELEASE.  
M4% = VERTICAL POS AT LAST RELEASE.

DESCRIPTION: THIS FUNCTION RETURNS THE BUTTON REGISTER, THE NUMBER OF RELEASES OF THE SPECIFIED BUTTON SINCE THIS FUNCTION WAS LAST CALLED AND IF THAT WAS NON-ZERO, THE POSITION OF THE MOUSE CURSOR AT THE LAST RELEASE.



## FUNCTION 7 - SET MIN AND MAX HORIZONTAL CURSOR POS.

PARAMETERS: M1% = 7  
 M3% = MIN HORIZONTAL POS.  
 M4% = MAX HORIZONTAL POS.

RETURN VALUES: NONE.

DESCRIPTION: THIS FUNCTION SETS THE MINIMUM AND MAXIMUM HORIZONTAL POSITIONS. IF THE CURRENT HORIZONTAL POSITION IS OUTSIDE THE NEW BOUNDS, THE CURSOR IS REPOSITIONED.

## FUNCTION 8 - SET MIN AND MAX VERTICAL CURSOR POS.

PARAMETERS: M1% = 8  
 M3% = MIN VERTICAL POS.  
 M4% = MAX VERTICAL POS.

RETURN VALUES: NONE.

DESCRIPTION: THIS FUNCTION SETS THE MINIMUM AND MAXIMUM VERTICAL POSITIONS. IF THE CURRENT VERTICAL POSITION IS OUTSIDE THE NEW BOUNDS, THE CURSOR IS REPOSITIONED.

## FUNCTION 10 - SET TEXT CURSOR.

PARAMETERS: M1% = 10  
 M3% = SCREEN MASK.  
 M4% = CURSOR MASK.

RETURN VALUES: NONE.

DESCRIPTION: THIS FUNCTION ALLOWS THE TEXT MODE MOUSE CURSOR TO BE CHANGED. THE CHARACTER AT THE CURRENT POSITION IS ANDED WITH THE SCREEN MASK AND THE RESULT IS XORED WITH THE CURSOR MASK. THE RESULT IS DISPLAYED AT THE CURRENT POSITION.

## FUNCTION 11 - READ MOUSE MOTION COUNTERS.

PARAMETERS: M1% = 11  
 RETURN VALUES: M3% = HORIZONTAL MICKEY COUNT  
 M4% = VERTICAL MICKEY COUNT.

DESCRIPTION: THIS FUNCTION RETURNS THE HORIZONTAL AND VERTICAL MICKEY COUNTS SINCE THIS FUNCTION WAS LAST CALLED.

## FUNCTION 12 - SET SUBROUTINE CALL MASK AND ADDRESS.

PARAMETERS: M1% = 12  
 M3% = CALL MASK.  
 M4% = SUBROUTINE ADDRESS.

RETURN VALUES: NONE.

DESCRIPTION: THIS FUNCTION ALLOWS A SUBROUTINE TO BE CALLED WHENEVER ONE OR MORE OF THE CONDITIONS DEFINED BY THE CALL MASK OCCURS. EACH BIT IN THE CALL MASK CORRESPONDS TO A SPECIFIC CONDITION:

BIT	CONDITION
0	CURSOR POSITION CHANGED.
1	LEFT BUTTON PRESSED.
2	LEFT BUTTON RELEASED.
3	RIGHT BUTTON PRESSED.

BIT	CONDITION
4	RIGHT BUTTON RELEASED.
5	MIDDLE BUTTON PRESSED.
6	MIDDLE BUTTON RELEASED.
7-15	NOT USED.

#### FUNCTION 20 - SWAP SUBROUTINES.

PARAMETERS: M1% = 20  
M3% = NEW CALL MASK  
M4% = NEW SUBROUTINE ADDRESS.  
RETURN VALUES: M3% = OLD CALL MASK.  
M4% = OLD SUBROUTINE ADDRESS.

**DESCRIPTION:** THIS FUNCTION ALLOWS A SUBROUTINE ADDRESS AND CALL MASK TO BE SET AS IN FUNCTION 12. THE DIFFERENCE IS THAT THE OLD ADDRESS AND MASK ARE RETURNED

#### FUNCTION 21 - GET MOUSE DRIVER STATE STORAGE REQUIREMENTS.

PARAMETERS: M1% = 21  
RETURN VALUES: M2% = BUFFER SIZE.

**DESCRIPTION:** THIS FUNCTION RETURNS THE SIZE REQUIRED TO STORE THE CURRENT STATE OF THE DRIVER.

#### FUNCTION 22 - SAVE MOUSE DRIVER STATE.

PARAMETERS: M1% = 22  
M4% = BUFFER POINTER.  
RETURN VALUES: NONE.

**DESCRIPTION:** THIS FUNCTION COPIES ALL MOUSE VARIABLES INTO THE PROVIDED BUFFER. IT IS ASSUMED THAT THE BUFFER IS BIG ENOUGH.

#### FUNCTION 23 - RESTORE MOUSE DRIVER STATE.

PARAMETERS: M1% = 23  
M4% = BUFFER POINTER.  
RETURN VALUES: NONE.

**DESCRIPTION:** THIS FUNCTION RESTORES THE MOUSE DRIVER STATE WHICH WAS PREVIOUSLY SAVED USING FUNCTION 22.

#### FUNCTION 24 - SET ALTERNATE SUBROUTINE CALL MASK AND ADDRESS

PARAMETERS: M1% = 24  
M3% = CALL MASK.  
M4% = SUBROUTINE ADDRESS.  
RETURN VALUES: M1% = ERROR FLAG (-1 IF ERROR).

**DESCRIPTION:** THIS FUNCTION ALLOWS UP TO THREE SUBROUTINES TO BE SPECIFIED. EACH CALL MASK MUST BE UNIQUE. THE CALL MASK DEFINITION IS:-

BIT	CONDITION
0	CURSOR POSITION CHANGED.
1	LEFT BUTTON PRESSED.
2	LEFT BUTTON RELEASED.
3	RIGHT BUTTON PRESSED.
4	RIGHT BUTTON RELEASED.

BIT	CONDITION
5	MIDDLE BUTTON PRESSED.
6	MIDDLE BUTTON RELEASED.
7	NOT USED.
8	SHIFT KEY PRESSED.
9	CTRL KEY PRESSED.
10	ALT KEY PRESSED.
11-15	NOT USED.

TO BE CONTINUED (YET AGAIN)!

## HI-RES GRAPHICS GEOMETRIC PLOTING BY BOB KITCH

THE FOLLOWING PROGRAM IS A SIMPLE LINE PLOTTING ROUTINE USING THE HI-RES GRAPHICS SCREEN. IT WAS WRITTEN TO TRY AND DEMONSTRATE HOW PROGRAMMING SKILLS CAN BE IMPROVED BY FOLLOWING A FEW SIMPLE GUIDELINES. IT IS A PLEA FOR MORE READABLE BASIC PROGRAMS.

UNFORTUNATELY PUBLISHED PROGRAMS, IN MAGAZINES, ARE GENERALLY POOR EXAMPLES OF HOW TO DEVELOP GOOD PROGRAMMING STYLE. A NUMBER OF US MAY HAVE TAKEN THE TROUBLE TO ENTER A LISTING FROM A MAGAZINE - BUT UPON RUNNING THE CODE HAVE FOUND THAT ALL IS NOT WELL!

A LONG, TEDIOUS AND FRUSTRATING SESSION OF UNDERSTANDING THE POORLY CONSTRUCTED CODE FOLLOWS. OFTEN THIS REQUIRES THAT THE TWISTS AND TURNS OF THE "LOGICAL SPAGHETTI" BE UNRAVELLED BEFORE DEBUGGING CAN COMMENCE. A USUAL REMEDY IS TO RE-WRITE THE PROGRAM FROM SCRATCH.

THE PROGRAM LINPLOT IS WRITTEN USING THE FOLLOWING GUIDELINES -

1. CLEARLY CODED AND SET OUT - AN ENORMOUS HELP TO UNDERSTANDING.
2. THE PROGRAM IS STRUCTURED - A GOOD ALGORITHM IS SELECTED AND THE PROGRAM "FLOWS" THROUGH INITIALIZATION, TO INPUT, PROCEDURE AND OUTPUT SECTIONS.
3. LOOPS ARE INDENTED FOR EASE OF IDENTIFICATION AND NESTING.
4. NAMING OF VARIABLES IS MEANINGFUL TO ASSIST MAINTENANCE AND DEBUGGING.
5. INTEGER STORAGE IS USED WHERE APPROPRIATE.
6. NO ABBREVIATED FORMS OF BASIC STATEMENTS ARE USED.
7. REMARKS ARE LIBERALLY SPRINKLED THROUGHOUT TO AID CLARITY
8. ERROR CAPTURE AND RANGE CHECKING ON ALL INPUT VARIABLES PREVENTS THE PROGRAM FROM CRASHING.

CLEAR READABLE CODE IS MORE IMPORTANT THAN THE EXECUTION SPEED OR STORAGE REQUIREMENTS OF A PROGRAM - INTERPRETED BASIC RUNS LIKE A TIRED SNAIL IN ANY CASE!

THESE GUIDELINES SHOULD LEAD TO CODE THAT IS EASIER TO READ, UNDERSTAND AND DEBUG. THIS LEADS TO EASIER MAINTENANCE, UPDATING OR EXPANSION OF YOUR ROUTINES AS YOUR PROGRAMMING SKILLS DEVELOP.

```

010 *****
020 *   PLOT A SET OF UP TO 20 LINES USING THE HI-RES SCREEN   *
030 *                                     BY R.B.KITCH 22/10/85   *
040 *****
090
100 ***DIMENSION STORAGE VECTORS X% & Y%.
110 DIM X%(20),Y%(20):CLS:***VECTORS TO HOLD END CO-ORDS.
115
120 ***ACCEPT INPUT AND CHECK.
130 INPUT"HOW MANY LINES - MAX 20 ";LN%
140 IF LN%<1 OR LN%>20 THEN GOTO 130
150 FOR I%=0 TO LN%      :***LOOP FOR LN%+1 X-Y POINTS.
160   INPUT"ENTER X-VAL 0-127 ";X%(I%)
170   IF X%(I%)<0 OR X%(I%)>127 THEN GOTO 160:***CHECK ON SCR N
180   INPUT"ENTER Y-VAL 0- 63 ";Y%(I%)
190   IF Y%(I%)<0 OR Y%(I%)> 63 THEN GOTO 180:***CHECK ON SCR N
200 NEXT I%
290
300 ***SET UP SCREEN AND MAIN PLOTTING LOOP.
310 MODE(1)      :***SWITCH SCREEN TO HI-RES.
320 FOR I%=0 TO LN%-1      :***ASSIGN MAIN LOOP FOR LN% LINES.
330   X1%=X%(I%):X2%=X%(I%+1):***ASSIGN END POINTS TO TEMP VAR
340   Y1%=Y%(I%):Y2%=Y%(I%+1):***ASSIGN END POINTS TO TEMP VAR
350 ***ARE THE POINTS THE SAME?
360   IF X1%<>X2% OR Y1%<>Y2% THEN GOTO 410
370   SET(X1%,Y1%)      :***END POINTS ARE THE SAME SO PLOT.
380   GOTO 710
390
400 ***CALCULATE X AND Y DIFFERENCE.
410   DX%=X2%-X1%;DY%=Y2%-Y1%:***CHANGE IN X & Y DIRECTIONS.
420 ***SEE WHICH IS LARGER.
430   IF ABS(DX%)>ABS(DY%) THEN GOTO 610
490
500 ***INCREMENT I% OR ALONG Y-AXIS.
510   YS%=SGN(DY%):DG=DX%/DY%:***SIGN OF STEP AND GRADIENT.
520   XO=X1%+0.5      :***X-AXIS OFFSET.
530   FOR IY%=Y1% TO Y2% STEP YS%:***INITIALIZE LOOP.
540     IP=(IY%-Y1%)*DG+XO:***TEMP REAL X-VALUE.
550     IX%=INT(IP)      :***INTEGER X-VALUE.
560     SET(IX%,IY%)
570   NEXT IY%
580   GOTO 710      :***PICK UP ANOTHER LINE.
600 ***INCREMENT Ix OR ALONG X-AXIS.
610   XS%=SGN(DX%):DG=DY%/DX%:***SIGN OF STEP AND GRADIENT.
620   YO=Y1%+0.5      :***Y-AXIS OFFSET.
630   FOR IX%=X1% TO X2% STEP XS%:***INITIALIZE LOOP.
640     IP=(IX%-X1%)*DG+YO:***TEMP REAL Y-VALUE.
650     IY%=INT(IP)      :***INTEGER Y-VALUE.
660     SET(IX%,IY%)
670   NEXT IX%
690
700 ***END LOOP FOR LINE.
710 NEXT I%:SOUND 28,6 :***END LOOP.
720 AN$=""
730 AN$=INKEY$:AN$=INKEY$ :***PAUSE FOR ANY KEYSTROKE.
740 IF AN$="" THEN GOTO 730
790
800 ***GO AGAIN?
810 CLS:PRINT" (E) TO EXIT":***SCREEN MESSAGE OR MENU.
820 PRINT" (P) TO PLOT AGAIN"
830 PRINT" (N) FOR NEW POINTS":PRINT

```

```

840 INPUT AN$ : '***ACCEPT RESPONSE.
850 AN$=LEFT$(AN$,1) : '***CLEAN IT UP.
860 IF AN$="E" THEN STOP : '***LOGICAL END TO PROGRAM.
870 IF AN$="P" THEN GOTO 310: '***GO BACK AND PLOT AGAIN.
880 IF AN$="N" THEN GOTO 130: '***GO BACK FOR MORE INPUT.
890 GOTO 810 : '***WRONG RESPONSE.
900 END

```

## LET'S INVESTIGATE SOUND ON THE VZ PART IV BY BOB KITCH

FOR THE NEXT SESSION ON SOUND GENERATION ON THE VZ, I WILL DETAIL SOME ARTICLES ON PERIPHERAL DEVICES THAT CAN BE CONNECTED TO THE VZ. THESE CAN GREATLY EXPAND THE APPEAL OF THE MACHINE AND ENHANCE YOUR INTEREST IN THE VZ. (NOT TO MENTION THE ENTHUSIASM THAT OTHERS WILL GET FOR THE COMPUTER.)

THERE ARE TWO TYPES OF "NOISE MAKING" PERIPHERALS. THESE ARE VOICE AND SOUND SYNTHESIS I.C. CHIPS. THESE ARE ALTERNATE AND NOVEL FORMS OF OUTPUT, TO THAT OBTAINED FROM THE SCREEN OR PRINTER, WHEN ONE HAS TIRED OF THESE ENTIRELY VISUAL FORMS OF OUTPUT. MUSIC SYNTHESIS EXCEEDS THE CAPABILITIES OF THE VZ'S INBUILT PIEZO-SPEAKER.

A NUMBER OF CIRCUITS AND PROJECTS HAVE APPEARED IN THE MAGAZINES OVER THE PAST FEW YEARS. THIS ARTICLE BRIEFLY IDENTIFIES THESE FOR THOSE WHO MAY WISH TO BUILD A BOARD OR ALTERNATIVELY REGISTER INTEREST WITH ME SO THAT WE CAN MAKE AVAILABLE THESE PERIPHERALS PLUS SOME OFF-THE-SHELF SOFTWARE.

IMAGINE THE BLOCKBUSTING USE OF VOICE AND MUSIC SYNTHESIS IN GAMES OR APPLICATIONS FOR THE VZ.

A COUPLE OF INTRODUCTORY ARTICLES ON SPEECH SYNTHESIS APPEARED IN BYTE SEP. 84, P.337 AND ITEC #26, P.812. THESE PROVIDE GOOD BACKGROUND.

	MAGAZINE	DATE	NAME	CHIP	INTERFACE	SOFTWARE
VOICE	EA	OCT. 82	COMPU-	VOTRAX	CENTRONICS	YES
		APR. 83	VOICE	SC-01		
	APC	DEC. 84	DIY	SC-01	CENTRONICS	YES
			SYNTH.			
	ETI	JAN. 85	CHATTER	SC-01	CENTRONICS	YES
		APR. 86	-BOX			
	ETI	MAR. 86	TALKING	GI	PARALLEL	NO
			VZ-200	SP0256		
AEM		FEB. 86	PROJECT	GI	CENTRONICS	YES
			4505	SP0256		
	PE	MAR. 85	BBC	GI	PARALLEL	YES
		JUN. 85		SP0256		
	PE	JAN. 86	SPECTRUM			YES
SOUND	APC	NOV. 84	DIY	TI	CENTRONICS	YES
			SYNTH.	SN76496		
	EA	AUG. 83	COMPU-	TI	CENTRONICS	YES
			MUSE	SN76489		

SO IF YOU ARE TIRED OF READING OUTPUT FROM YOUR COMPUTER, WHY NOT TRY LISTENING INSTEAD?

WHEN THE DISK DRIVE FIRST BECAME AVAILABLE FOR THE VZ 200/300 COMPUTERS THINGS WERE SIMPLE AND THERE WAS NO CONFUSION AS THERE WERE ONLY 3 FILETYPES TO WORRY ABOUT, EG:

T:FILENAME 7AE9 XXXX XXXX - TEXT FILE - (BASIC PROGRAM)

B:FILENAME XXXX XXXX XXXX - BINARY FILE - (MACHINE/OBJECT CODE)

B:FILENAME 7000 7800 0800 - BINARY FILE - (HI-RES SCREEN)

B:FILENAME C000 FFFF 4000 - BINARY FILE - (MEMORY BLOCKS)

D:FILENAME 0000 0000 0000 - DATA FILE - (PROGRAM GENERATED)

AS VZ USERS STARTED WRITING PROGRAMS FOR DISK DRIVE USE AND QUITE OFTEN WITHOUT CONSULTATION WITH OTHERS THEY INTRODUCED OTHER FILETYPES AND THE CONFUSION AND INCOMPATIBILITY BEGAN. BELOW IS A LIST OF THE NEW FILETYPES, THEIR USES AND THEIR AUTHORS.

### DISK ED/ASS SOURCE CODE FILETYPES

A:FILENAME A280 XXXX XXXX - EDITOR ASSEMBLER - RH - RUSSELL HARRISON  
 S:FILENAME A280 XXXX XXXX - EDITOR ASSEMBLER - DM - DAVE MITCHELL  
 S:FILENAME A280 XXXX XXXX - EDITOR ASSEMBLER - MH - MARK HARWOOD  
           A280 XXXX XXXX - VARIANT - BG - BRIAN GREEVE  
           A280 XXXX XXXX - VARIANT - PH - PETER HICKMAN  
 W:FILENAME A813 XXXX XXXX - DISKOPS Ed/Ass. - LM - LESLIE MILBURN

THERE ARE FOUR BASIC DISK VERSIONS AND TWO VARIANTS OF DICK SMITH'S EDITOR ASSEMBLER WHOSE SOURCE CODE FILES ARE NOT COMPATIBLE WITH EACH OTHER. AS YOU'LL NOTE THERE ARE THREE DIFFERENT FILETYPE'S, A, S AND W AND TWO DIFFERENT START ADDRESSES, (A280 & A813).

### DISK WORD PROCESSOR FILETYPES

W:FILENAME XXXX D000 XXXX - PATCH 3.3 - DM - DAVE MITCHELL  
 W:FILENAME XXXX XXXX XXXX - WORDPRO - RH - RUSSELL HARRISON  
 F:FILENAME 0000 FFFF FFFF - QUICKWRITE - LM - LESLIE MILBURN

AGAIN INCOMPATIBILITY IS THE NAME OF THE GAME WITH DIFFERENT FILETYPE'S AND START AND END ADDRESSES. TO ADD MORE CONFUSION THERE ARE TWO WORD PROCESSOR AND ONE EDITOR ASSEMBLER SHARING A W:FILETYPE.

### CONVERTING SOURCE CODE FILES

TO DENOTE THE VARIOUS EDITOR ASSEMBLERS AND THEIR SOURCE CODE, INITIALS WILL BE USED FOR COMPARISON PURPOSES. SEE LAST TWO CHARACTERS IN FILENAME BELOW. I'LL USE LESLIE MILBURN'S EXT12.1 (PART II IN THIS ISSUE) AS AN EXAMPLE.

S:EXT-DM 01 00 A280 CF0A 2C8A  
 S:EXT-MH 01 00 A280 CF0C 2C8C  
 A:EXT-RH 01 00 A280 CF0C 2C8C  
 W:EXT-LM 01 00 A813 D4A0 2C8D

I STARTED OUT WITH W:EXT-LM SOURCE CODE FILE AND AFTER CONVERSION ARRIVED AT THE REST. CONVERTING CAN BE AS SIMPLE AS CHANGING FILETYPE AND OR START/END ADDRESSES. I USED LESLIE MILBURN'S EXT12.1 DOS UTILITY AS THE MOST SUITABLE FOR THE PURPOSE AS IT HAS TWO OF THE COMMANDS REQUIRED. THEY ARE:

- 1) CHA"FILENAME",X
- 2) REL"FILENAME",XXXX

TO CHANGE FILETYPE ACTIVATE EXT12.1 AND TYPE IN:

```
CHA"EXT.LM",S <RETURN>
THIS WILL CHANGE (W) FILETYPE TO (S)
```

TO CHANGE START AND END ADDRESSES TYPE IN:

```
REL"EXT.LM",A280 <RETURN>
```

NOTE 1: EXT12.1 WILL AUTOMATICALLY WORK OUT NEW END ADDRESS TO CORRESPOND TO NEW START ADDRESS AND UPDATE DISK DIRECTORY.

NOTE 2: DM(S), MH(S), RH(A) AND LM(W) = THE 4 SOURCE CODE FORMATS.

AND NOW TO THE DETAILS ON HOW TO CONVERT SOURCE CODE FOR USE BETWEEN EDITOR ASSEMBLERS.

- DM - WILL LOAD DM(S) AND MH(S) WITHOUT MODIFICATION.  
WILL LOAD RH(A) AFTER CHANGING FILETYPE TO DM(S).  
WILL LOAD LM(W) AFTER CHANGING FILETYPE TO DM(S)  
AND START ADDRESS FROM A813 TO A280.
- MH - WILL LOAD MH(S) WITHOUT MODIFICATION.  
WILL LOAD RH(A) AFTER CHANGING FILETYPE TO MH(S).  
WILL LOAD DM(S) AFTER USING ASM.DM AND COMPAT ROUTINE  
TO CONVERT DM(S) TO MH(S) FORMAT.  
WILL LOAD LM(W) AFTER CHANGING TO DM(S) FORMAT AND  
THEN TO MH(S) FORMAT.
- RH - WILL LOAD RH(A) WITHOUT MODIFICATION.  
WILL LOAD MH(S) AFTER CHANGING FILETYPE TO RH(A).  
WILL LOAD DM(S) AFTER CHANGING TO MH(S) FORMAT AND  
CHANGING FILETYPE TO RH(A).  
WILL LOAD LM(W) AFTER CHANGING TO DM(S) FORMAT AND THEN  
TO MH(S) FORMAT AND CHANGING FILETYPE TO RH(A).
- LM - WILL LOAD LM(W) WITHOUT MODIFICATION  
WILL LOAD DM(S) AFTER CHANGING START ADDRESS TO A813 AND  
FILETYPE TO LM(W).  
WILL LOAD MH(S) AFTER FIRST CHANGING TO DM(S) FORMAT AND  
THEN TO LM(W) FORMAT.  
WILL LOAD RH(A) AFTER FIRST CHANGING TO DM(S) AND THEN  
CHANGING DM(S) TO LM(W) FORMAT.

THE FOLLOWING ARE THE EDITOR ASSEMBLERS USED FOR COMPILING THIS ARTICLE AND ONCE AGAIN INITIALS ARE USED TO DENOTE AUTHORS.

```
B:ASM.DM 01 0D 7AFD A2F3 27F6
S:COMPAT 01 02 A280 A7C2 0542 - CONVERT ROUTINE TO CHANGE
DM(S) FORMAT TO MH(S) FORMAT.
B:ASM.MH 06 0F 7AFD A2A3 27A6
B:ASM.LM 0C 00 7AFD BF01 4404 - DISKOPS 6, 64K VERSION.
T:ASM.RH 14 0B 7AE9 7B29 0040 - 34K VERSION.
B:ASM1 14 0C FC00 FE81 0281
B:ASM2 15 02 7AFA A301 2807 - NOTE: ASM.RH CONSISTS OF 3 FILES.
```

THE EDITOR ASSEMBLER I PREFER IS DAVE MITCHELL'S VERSION AS IT IS MORE COMPATIBLE THAN THE OTHERS AND CAN CONVERT BOTH WAYS BETWEEN ASM.MH AND ASM.DM, ED.

## Z80A TIMING DIAGRAMS

THE MAIN AIM OF THE TIMING DIAGRAMS IS TO SHOW YOU WHAT HAPPENS TO THE IORQ, RD AND WR LINES WHEN THE I/O (INP OR OUT) FUNCTIONS ARE USED.

WHEN A PORT IS READ BY USING THE INP FUNCTION THE IORQ AND RD LINES GO LO WHILE WRITE LINE STAYS HI. WHEN WE WRITE TO A PORT USING THE OUT FUNCTION THE IORQ AND WR LINES GO LO WHILE THE READ LINE STAYS HI.

THIS MEANS THAT BOTH THE READ AND WRITE LINES CAN NEVER BE (1) OR (0) AT THE SAME TIME. WE CAN PUT THIS TO GOOD USE BY MAKING A READ (I/P) ONLY PORT OR WRITE (O/P) ONLY PORT OR A READ/WRITE (I/O) PORT.

## 74LS138 TRUTH TABLE

THE 74LS138, 3 OF 8 DECODER IC IS THE MOST COMMONLY FOUND DECODER USED IN VZ APPLICATIONS. IT IS AN ACTIVE LO DEVICE AND FOR IT TO WORK EN1 BAR AND EN2 BAR MUST BE LO WHILE EN3 MUST BE HI.

## INPUT/OUTPUT PORT DECODING

ON PAGE 17, THE LEFT DECODER DECODES IN 16 BIT BLOCKS IN THE PORT ADDRESS RANGE OF A0 TO A127. TO MAKE IT A READ/WRITE PORT CONNECT +5V TO PIN 6, EN3 (POSITIVE ENABLE). FOR A READ ONLY PORT CONNECT THE WR LINE TO PIN 6 WHILE FOR WRITE ONLY PORT CONNECT THE RD LINE TO PIN 6.

BECAUSE WE ARE USING A POSITIVE ENABLE TO CONTROL WHAT THE PORT WILL DO WE HAVE TO INVERT THE RD AND WR LINES BY USING THE OPPOSITE. REFER TO THE TIMING DIAGRAMS FOR CLARIFICATION.

THE SECOND DECODER DECODES IN THE RANGE OF A128 TO A255. BECAUSE WE ARE USING A NEGATIVE ENABLE IT IS EASIER TO UNDERSTAND. CONNECT GND TO PIN 5, EN2 BAR FOR READ/WRITE PORT. RD TO PIN 5 FOR A READ ONLY PORT OR WR FOR A WRITE ONLY PORT.

YOU'LL NOTE BOTH DECODERS ARE NEARLY IDENTICAL, EXCEPT FOR A7 WHICH IS USED TO SELECT DECODING RANGE. IN THE FIRST DECODER A7 IS CONNECTED TO PIN 5, A NEGATIVE ENABLE. THIS MEANS ANY PORT GREATER THAN 128 CANNOT BE SELECTED. IN THE SECOND DECODER A7 IS CONNECTED TO PIN 6, A POSITIVE ENABLE WHERE A7 LOCKS OUT ANY PORT LESS THAN 128.

## TECHNICAL DATA SHEET # 4

PAGE 18 SHOWS A READ/WRITE PORT, A READ ONLY PORT AND A WRITE ONLY PORT IN THE PORT ADDRESS RANGES OF A0 TO A127 AND A128 TO A255.

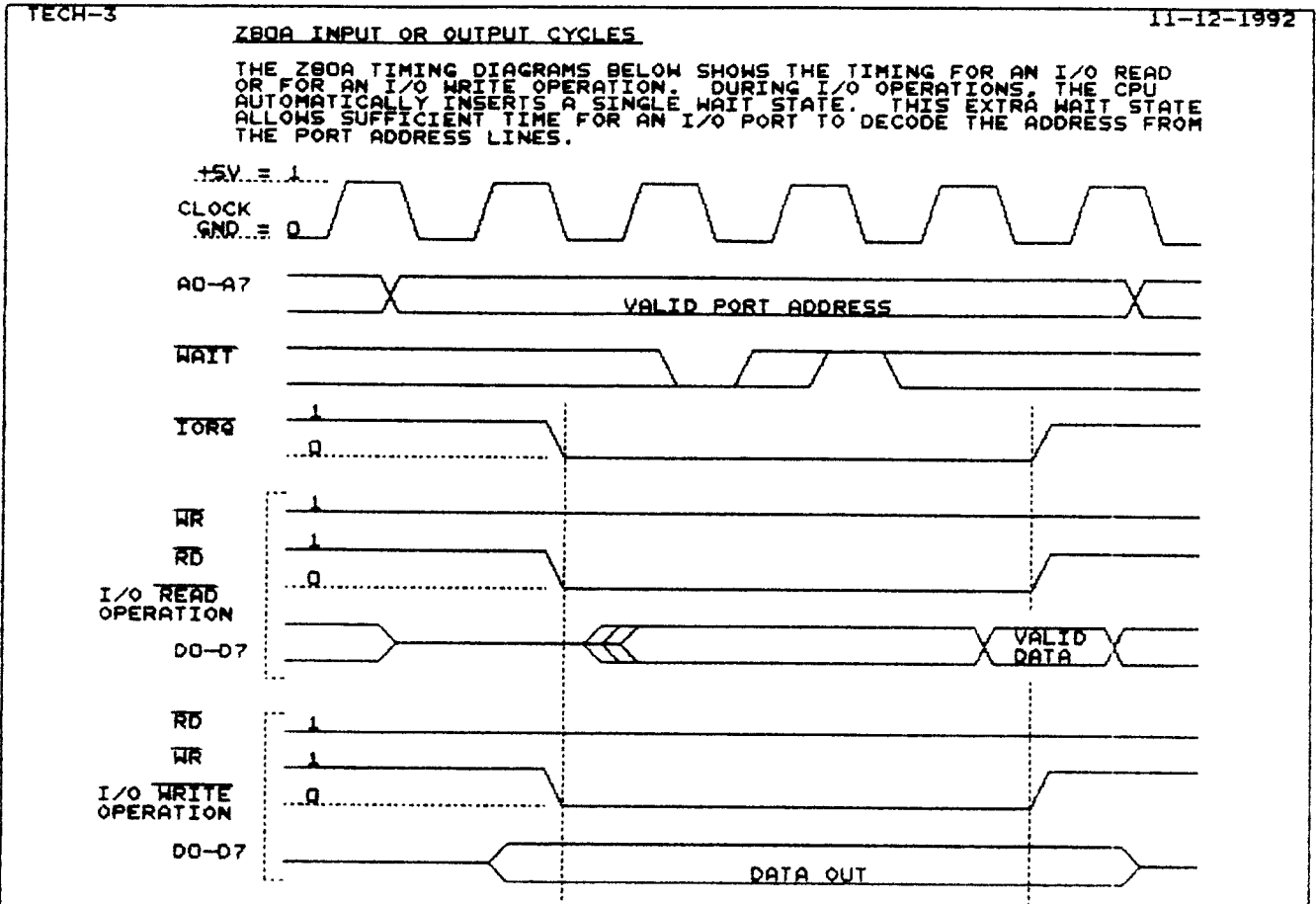
THE 64K RAM EXPANSION DECODER IS CONFIGURED AS A READ/WRITE PORT BUT CAN BE CHANGED TO A READ ONLY PORT OR WRITE ONLY PORT BY REMOVING GND FROM PIN 5 AND CONNECTING EITHER THE RD OR WR LINE TO PIN 5.

THE 32 BIT DECODER SHOWS IT IS CONNECTED AS A READ/WRITE PORT BUT CAN BE CHANGED TO TO READ ONLY PORT OR WRITE ONLY PORT AS SHOWN IN PREVIOUS EXAMPLE.

**NEXT ISSUE : MEMORY DECODING.**



Z80A I/O TIMING DIAGRAMS  
74LS138 TRUTH TABLE  
INPUT/OUTPUT PORT DECODING

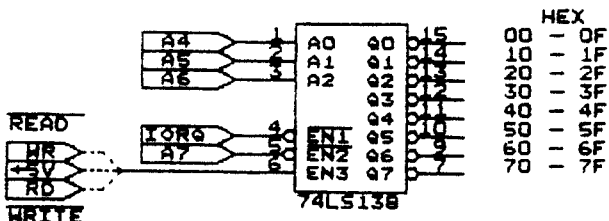


X = DONT CARE ...74LS138 TRUTH TABLE... 1 = HI / 0 = LO

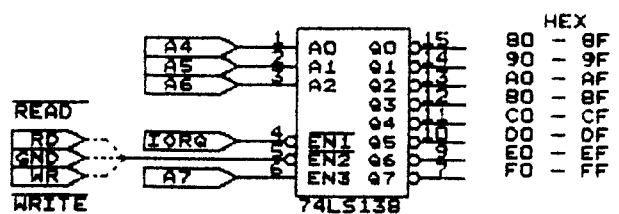
INPUTS						OUTPUTS							
ENABLE			SELECT										
EN1	EN2	EN3	A0	A1	A2	Q0	Q1	Q2	Q3	Q4	Q5	Q6	Q7
1	X	X	X	X	X	1	1	1	1	1	1	1	1
0	1	0	0	0	0	0	1	1	1	1	1	1	1
0	0	1	0	0	0	1	0	1	1	1	1	1	1
0	0	0	1	0	0	1	1	0	1	1	1	1	1
0	0	0	1	1	0	1	1	1	0	1	1	1	1
0	0	0	1	1	1	1	1	1	1	0	1	1	1
0	0	0	1	0	1	1	1	1	1	1	0	1	1
0	0	1	1	1	1	1	1	1	1	1	1	0	0

...INPUT/OUTPUT PORT DECODING BY JOE LEON...

**16 BIT BLOCK I/O DECODER = 00H - 7FH**



**16 BIT BLOCK I/O DECODER = 80H - FFH**

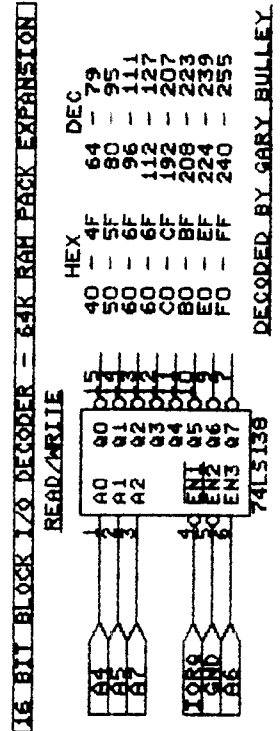
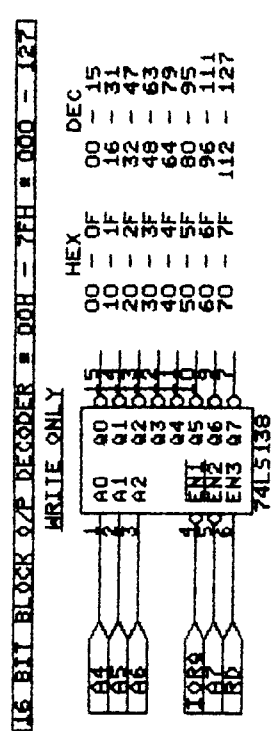
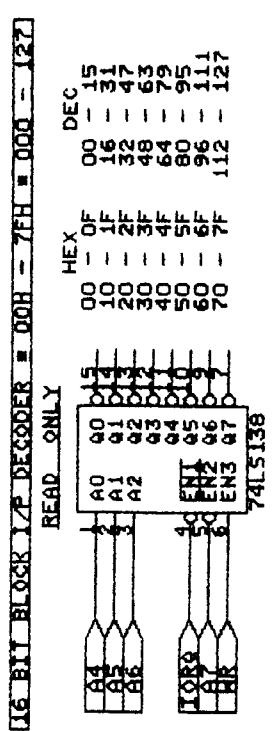
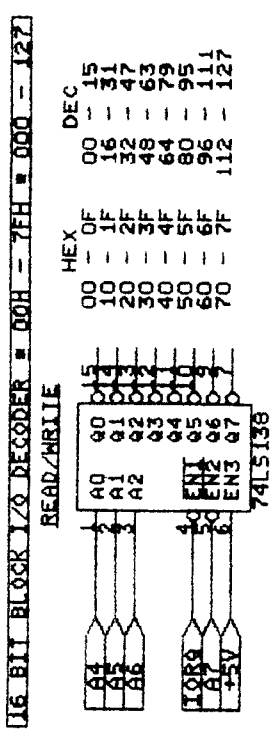
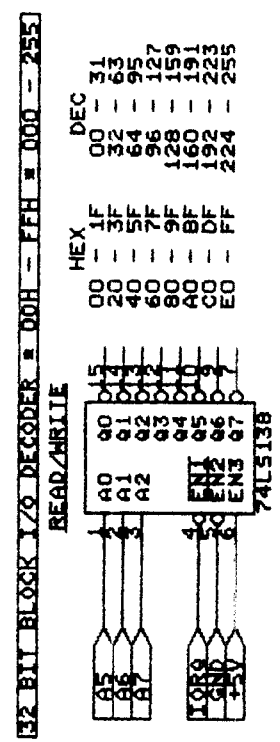
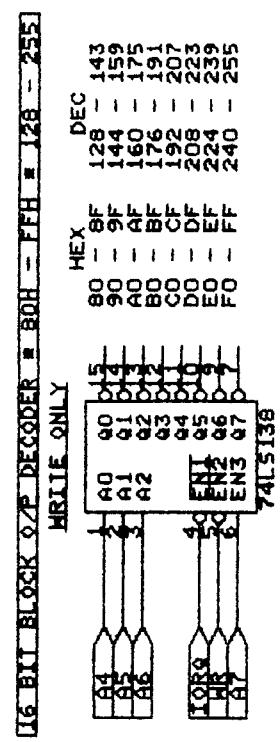
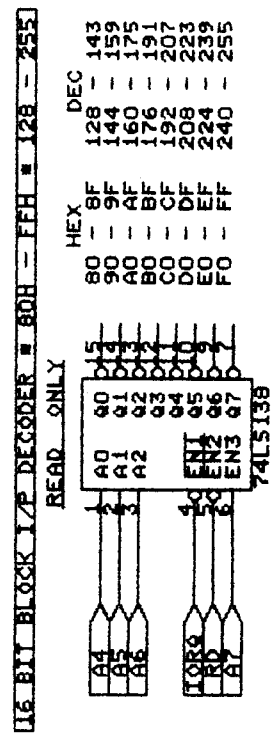
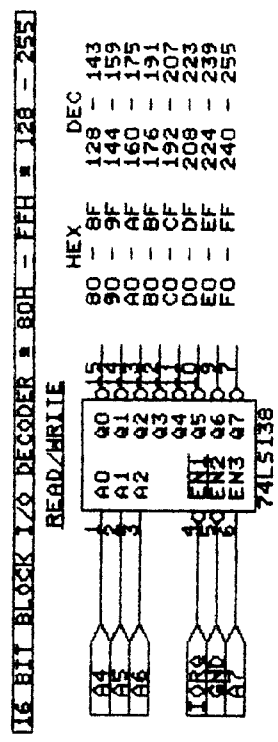


INPUT/OUTPUT PORT DECODING

11-12-1992

...INPUT/OUTPUT PORT... DECODING... BY... JOE... LEON...

TECH-4



**E & F WP PATCH 3.3:** PATCH 3.3 WRITTEN BY DAVE MITCHELL WILL CONVERT YOUR E & F TAPE WORD PROCESSOR FOR FULL DISK USE WHILE RETAINING ALL ORIGINAL FUNCTIONS. IT ALSO HAS SHIFT LOCK AND PRINTER CONTROL CODES WHICH CAN BE IMBEDDED IN TEXT AND SAVED TO TAPE OR DISK.

**BSTWP.F:** THIS UTILITY PROVIDED WITH PATCH 3.3 WILL CONVERT BASIC PROGRAMS AND ED/ASS. SOURCE CODE FILES INTO WORD PROCESSOR FILES.

**PRICE:** AUS/NZ AUS\$20.00 - UPDATE - AUS-\$10.00 - NZ-AUS\$11.00.

**EXTENDED DOS V1.3:** THESE COMMANDS ARE AT YOUR DISPOSAL: MERGE, DIRA, DIRB, DIRC, DIRD, OLD, OLD., DEC, HEX, MENU, CODE, LTAB, MOVE AND UPDATE, STATUSA AND LSTATUSA. STATUSA AND LSTATUSA ALSO WORKS WITH VERSION 1.0 DOS

**PRICE:** AUS\$15.00 - POSTAGE INCLUDED

**MENU/FILE COPIER:** THIS UTILITY WILL READ YOUR DISK DIRECTORY AND PRESENT YOU WITH SEVERAL OPTIONS. USING THE CURSOR YOU CAN RUN/BRUN ANY PROGRAM OR SELECT FILE COPY, REN, ERASE, DRIVE 1 OR 2, ETC. BESIDES COPYING TEXT AND BINARY FILES ALL OTHER FILES CAN BE COPIED AS WELL EXCEPT FOR DATA FILES.

**PRICE:** AUS\$15.00 - POSTAGE INCLUDED

**FOR PURCHASE OR INFORMATION CONTACT:**

DAVE MITCHELL 24 ELPHINSTONE STREET  
NORTH ROCKHAMPTON QUEENSLAND 4701  
AUSTRALIA - PHONE: (079) 27 8519

**PETER HICKMAN SOFTWARE - PUBLIC DOMAIN**

**VZ DISASSEMBLER:** WHAT, ANOTHER DISASSEMBLER? BUT, YOU HAVE ALREADY GOT ONE? THIS ONE IS DIFFERENT! THIS PROGRAM IS ENTIRELY WRITTEN IN MACHINE CODE. IT ACTUALLY RUNS ABOUT 40 TIMES FASTER THAN D.S.E.'S DISASSEMBLER (OR ANY ONE ELSE'S). IT WILL DISASSEMBLE ANY PROGRAM THAT YOU CAN BLOAD INTO MEMORY. IT WORKS WITH ANY VZ CONFIGURATION. IT DISASSEMBLES EVEN THE 88 EXTRA Z80 OPCODES THAT ZILOG DOESN'T ADMIT TO.

TAPE AND DISK VERSIONS AVAILABLE.

**VZ MODEM SOFTWARE:** DID YOU WANT TO TALK TO OTHER COMPUTERS VIA A MODEM? DID YOU BUY THE DSE TERMINAL EPROM, ONLY TO DISCOVER THAT IT ONLY WORKS WITH TAPE. IT ONLY ALLOWS YOU TO PRINT FILES, NOT SAVE THEM OR SEND THEM!

YOUR PROBLEMS ARE SOLVED! THE HICKMAN BROTHERS, PETER AND ANDREW, HAVE A BRAND NEW PROJECT WHICH WILL ALLOW YOU TO SEND, RECEIVE & SAVE FILES VIA A MODEM. IT WORKS WITH DISK!

INCLUDED ARE INSTRUCTIONS FOR THE HARDWARE MODIFICATIONS. A SMALL MODIFICATION IS NEEDED TO YOUR DISK CONTROLLER. YOUR USER GROUP MAY HELP YOU MODIFY YOUR COMPUTER TO USE THIS EXCITING NEW SOFTWARE!

THE MANUAL IS SUPPLIED ON DISK FOR PRINTING OUT WITH YOUR DISK VERSION OF E & F W/PROCESSOR. IF YOU DO NOT OWN AN E & F W/PROCESSOR THEN PLEASE ENCLOSE ANOTHER \$5.00 (TOTAL \$30.00) FOR PHOTOCOPYING AND POSTAGE OF THE MANUAL.

**PRICE:** A NOMINAL FEE TO COVER COSTS. CHECK WITH PETER FOR EXACT AMOUNT.

**FOR FURTHER INFORMATION CONTACT:**  
PETER HICKMAN PO BOX 8 WERRINGTON 2747

**\*\* \*\* CONTRIBUTIONS TO THE JOURNAL \*\* \*\***

IF YOU ARE THINKING OF CONTRIBUTING TO THE JOURNAL THE PREFERRED FORMAT IS BASIC LISTINGS, WORD PROCESSOR OR SOURCE CODE FILES ON TAPE OR DISK. FILES FROM THE FOLLOWING WORD PROCESSORS CAN BE ACCEPTED :-

E & F TAPE OR DISK PATCH 3.1-3.3, WORDPRO CARTRIDGE, WORDPRO PATCH, MOST SOURCE CODE FILES AND ALL QUICKWRITE WORD PROCESSOR FILES.

**\*\* \*\* CLUB MEETINGS - ALL WELCOME \*\* \*\***

FIRST FRIDAY OF MONTH

**\*\* \*\* FUTURE MEETINGS - NEW VENUE \*\* \*\***

AS MENTIONED BEFORE WE NO LONGER MEET AT JNC, BUT AT VARIOUS MEMBERS HOMES. MEETINGS WILL BE ONCE A MONTH AS BEFORE WITH THE DATES BEING FIRST FRIDAY OF THE MONTH.

BECAUSE OF SOME LOCAL MEMBERS HAVING TO WORK SHIFTWORK MEETING DATES WILL BE ADJUSTED TO ACCOMMODATE THEM. WHETHER YOU ARE A LOCAL MEMBER, INTRA OR INTERSTATE VISITOR PLEASE CHECK WITH JOE LEON FIRST BEFORE COMING OUT.

JOE LEON 33 TIGHES Tce TIGHES HILL 2297 (049) 692 399

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